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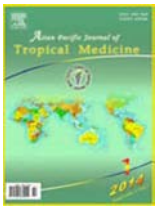

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# Epidemiology of hydatid disease in Qatar: a hospital based study from 2000 to 2013

Ahmed Mohamad Al-Ani[1*], Fahmi Yousif Khan[1], Abdel-Naser Elzouki[1], Mohamad Al Hajri[2], Walid Ibrahim[1]

[1]*Departments of Medicine, Hamad General Hospital, Weil Cornell Medical College, Doha, Qatar*

[2]*Hamad General Hospital, Hamad Medical Corporation, Doha, Qatar*

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ABSTRACT

**Objectives:** To describe the epidemiological and clinical profile, treatment and outcome for hydatid diseases among the patients admitted to Hamad General Hospital.

**Methods:** This retrospective study was carried out on patients admitted to Hamad General Hospital between 1st January 2000 and 31st December 2013. Descriptive statistics including range and percentage were used in analyzing the patient characteristics and laboratory parameters.

**Results:** Hydatid disease was confirmed in 32 patients. The mean age of them was (35.59±13.00) years (range: 11-67 years) and 90.6% (29/32) of them were non-Qataris with male predominance. The main presenting symptom was abdominal pain 71.9% (23/32) followed by fever 45.9% (15/32). The main presenting sign was hepatomegaly 62.5% (20/32). Single organ involvement was found in 87.5% (28/32) and the common site involved was the liver 81.3% (26/32) followed by the lung 15.6% (5/32). The diagnosis was established by abdominal ultrasound and/or abdominal CT and confirmed by serology in all patients. The diagnosis was confirmed by histology in 90.6% (29/32) patients. All patients received albendazole, and 90.6% (29/32) patients had surgical intervention. Duration of albendazole therapy was (53.9±51.5) d. All patients were cured.

**Conclusions:** Hydatid disease is uncommon in Qatar. It occurs mainly among non-Qataris from endemic areas and affects the liver mostly. Surgical intervention and albendazole administration are highly effective.

## 1. Introduction

Echinococcosis (hydatid disease) is a zoonotic parasitic disease of human and mammalians caused mainly by the larval stage of dog tapeworm *Echinococcus granulosus*. The common sheep/dog cycle is usually considered as the major source of human contamination. The definitive hosts (dogs) harboring the adult worms in their intestinal tract. The worms pass eggs in the dog stool, which are ingested by herbivores or humans; the eggs hatch releasing larvae (oncosphere) that invade through the intestinal wall and evolve to hydatid cysts. Herbivores play a suitable intermediate host. Within the fertile cysts are the protoscoleces derived from the germinal layer, which if ingested by a dog evaginate and develop into adult worms[1-3]. The parasite is prevalent in areas where livestock is raised in association with dogs including Australia, Latin America, Eastern Europe, Africa and the Middle East[4].

There is a lack of information about the prevalence, epidemiology and clinical pattern of human hydatidosis in most gulf countries particularly in Qatar. So this retrospective study was prompted to conduct to determine the prevalence and to describe the clinical findings, diagnostic methods, treatment, and outcome of human hydatidosis in Qatar.

*Corresponding author: Ahmed Mohamad Al-Ani, Departments of Medicine, Hamad General Hospital, Weil Cornell Medical College, Doha, Qatar.
Tel: 97455561107
E-mail: ahmda@yahoo.com

## 2. Materials and methods

### 2.1. Setting

This study was conducted at Hamad General Hospital

in Qatar from 2000 to 2013. This hospital, which was accredited by Joint Commission International in 2006, is a tertiary centre that covers all specialties except for hematology-oncology and obstetrics. It includes six intensive care units, which provide a full range of clinical services in different departments of surgery and internal medicine.

### 2.2. Study design, population and data source

This study involved all patients admitted to Hamad General Hospital with hydatid disease from 1st January 2000 to 31st December 2013. The cases were identified retrospectively by review of pharmacy, infection control unit and hospital discharge records. This was followed by a retrospective chart review.

### 2.3. Data collection and statistical analysis

Data were collected into a special form, including demographic data, clinical presentation, investigations done, treatment received and outcome (30-d mortality and cure).

The data were analyzed with SPSS 11.00 software (SPSS, Inc., Chicago, IL, US) using simple descriptive statistics.

### 2.4. Research committee approval

This study was given ethical approval by the medical research committee at Hamad Medical Corporation. As the study was retrospective, a waiver of informed consent was obtained from the research committee.

## 3. Results

During the period of study, hydatid disease was confirmed in 32 patients. The mean age of them was (35.59 ±13.00) years (range: 11-67 years) and 90.6% (29/32) of them were non-Qataris with male predominance (M/F: 20/12) (Table 1). The maximum number of patients was found in the age group of 25-34 years.

The main presenting symptom was abdominal pain 71.9% (23/32) followed by fever 45.9% (15/32). The main presenting sign was hepatomegaly 62.5% (20/32). Single organ involvement was found in 87.5% (28/32) and the common site involved was the liver 81.3% (26/32) followed by the lung 15.6% (5/32). The diagnosis was established by abdominal ultrasound and/or abdominal CT and serology in all patients. The diagnosis was confirmed by histology in 90.6% (29/32) patients. All patients received albendazole, and 90.6% (29/32) patients had surgical intervention. Duration of albendazole therapy was (53.9 ±51.5) d (range: 28-180 d). All patients cured, and no mortalities have been found.

**Table 1**

Demographic and clinical characteristics of patients involved in this study.

| Variable | N (%)/Mean±SD |
|---|---|
| Sex (M/F) | 20/12 |
| Age (mean±SD) (years) | 35.59±13.00 |
| Age group | |
| 0-14 | 1 (3.1%) |
| 15-24 | 5 (16.1%) |
| 25-34 | 12 (37.5%) |
| 35-44 | 8 (25.0%) |
| ⩾45 | 6 (19.4%) |
| Presenting symptoms and signs | |
| Abdominal pain | 23 (71.9%) |
| Fever | 15 (46.9%) |
| Vomiting | 12 (37.5%) |
| Anorexia | 8 (25.0%) |
| Dyspnea | 5 (15.6%) |
| Hemoptysis | 3 (9.4%) |
| Chest pain | 3 (9.4%) |
| Hematemesis | 1 (3.1%) |
| Hepatomegaly | 20 (62.5%) |
| Splenomegaly | 2 (6.3%) |
| Jaundice | 2 (6.3%) |

WBC: white blood cell, US: ultrasonography.

**Table 1, continued**

| Variable | N (%)/Mean±SD |
|---|---|
| Investigations | |
| WBC>11 000/μL | 7 (21.9%) |
| Eosinophilia>1 000/μL | 6 (18.8%) |
| Total bilirubin (>34 μmol/L) | 5 (15.6%) |
| Suggested by imaging studies (US&CT) | 32 (100%) |
| Positive serology | 32 (100%) |
| Positive histology | 29 (90.6%) |
| Sites involved | |
| Liver | 26 (81.3%) |
| Lung | 5 (15.6%) |
| Kidney | 2 (6.3%) |
| Spleen | 2 (6.3%) |
| Other sites | 3 (9.4%) |
| Comorbidities | 3 (9.4%) |
| Treatment | |
| Medical | 32 (100%) |
| Surgical | 29 (90.6%) |
| Mortality | 0 |

WBC: white blood cell, US: ultrasonography.

## 4. Discussion

The actual incidence of human hydatidosis in Qatar is not known accurately. A careful retrospective study of hospital records from 1st January 2000 to 31st December 2013, identified 32 cases, 90.6% of them are non-Qataris from endemic areas.

Lifecycle of the parasite in Middle East countries depends on the facility to reach discarded entrails of livestock by dogs (especially stray dogs). In Qatar, although all sheep and goats are imported from endemic countries for hydatid disease such as Saudi Arabia, Syria, Jordan, Iran, Oman and Somali, all slaughterhouses are under health authorities' strict supervision. From 2006 to 2013, health authority discovered 9 202 (9003 in Table 2) infected animals (Table 2). The contaminated entrails of the slaughtered sheep and goats usually are treated chemically and buried underground. Moreover, there are no stray dogs in Qatar. This makes the occurrence of this disease indigenously in Qatar unlikely. Thus we think that all cases in this study are imported.

In consistent with some studies from Iran, Greece and India[1,4-6], abdominal pain was the most common symptom and liver was the most frequently involved site. In Mauritania, the pulmonary localization seems to be the most frequent[7]. The unusual location of primary hydatid disease such as thyroid gland, heart and intraperitoneal is still a diagnostic challenge[6,8,9].

**Table 2**

Number of reported Hydatid disease infected animals between 2006-2013.

| Years | Number of cases |
|---|---|
| 2006 | 770 |
| 2007 | 325 |
| 2008 | 680 |
| 2009 | 702 |
| 2010 | 652 |
| 2011 | 1182 |
| 2012 | 1331 |
| 2013 | 3561 |

All reported cases above were found in livers of goats and sheep exported from different origin including Syria, Saudi Arabia, Iran, Somalia and Oman.

In the diagnostic workup of hydatid disease, ultrasonography, CT and magnetic resonance image are helpful in establishing the diagnosis. The diagnosis of hydatid disease is based mostly on imaging with ultrasonography with sensitivity ranges between 93% and 98%[10]. CT confirms the diagnosis by detecting the presence of daughter cysts and calcification in cyst wall with sensitivity ranges between 90% and 97%[10]. Magnetic resonance image demonstrates the features of the cyst adequately.

The serological tests for *Echinococcus granulosus* are available with low sensitivity and specificity.

In this study, the diagnosis was established by abdominal ultrasound and/or abdominal CT and serology in all patients.

Treatment comprises mainly surgical intervention or percutaneous treatment and/or high dose, long-term therapy with albendazole alone or in combination with praziquantel[11]. Surgery, conservative or radical, has been the traditional approach for treatment of the disease in all locations[6]. In the series, all patients received albendazole and 90.6% (29/32) patients had surgical intervention with a variety of techniques.

In conclusion, hydatid disease is uncommon in Qatar. It occurs mainly among non-Qataris from endemic areas and affects the liver mostly. Surgical intervention and albendazole administration are highly effective.

## Conflict of interest statement

We declare that we have no conflict of interest.

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